

**P a t e n t   C l a i m s :**

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1.    A method of estimating pitch in a speech signal,  
5           comprising the steps of:

- sampling the speech signal to obtain a series of samples,
- dividing the series of samples into segments, each segment having a fixed number of consecutive samples,
- 10           •    calculating for each segment a conformity function for the signal,
- detecting peaks in the conformity function,

15           the method further comprising the steps of:

- providing an intermediate signal derived from the speech signal,
- converting said intermediate signal to a binary signal, said binary signal being set to logical "1" where the intermediate signal exceeds a pre-selected threshold and to logical "0" where the intermediate signal does not exceed the pre-selected threshold,
- 20           •    calculating an autocorrelation of the binary signal, and
- 25           •    calculating an autocorrelation of the binary signal, and

- using distance between peaks in the autocorrelation of the binary signal as an estimate of the pitch.

5        2. A method according to claim 1, wherein the intermediate signal is provided by filtering the speech signal through a filter based on a set of filter parameters estimated by using linear predictive analysis (LPA).

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3. A method according to claim 1, wherein the intermediate signal is provided by calculating the autocorrelation of a signal derived from the speech signal by filtering the speech signal through a filter based on a set of filter parameters estimated by means of linear predictive analysis (LPA).

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4. A method according to claim 1, further comprising the step of:

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- selecting, if the peak corresponding to the distance between the peaks is represented by a number of samples, the sample having the maximum amplitude of said conformity function as the estimate of the pitch.

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5. Use of the method according to claim 1 in a mobile telephone.

6. A device adapted to estimate pitch of a speech signal, comprising:

- a sampler for sampling the speech signal to obtain a series of samples,
- a divider for dividing the series of samples into segments, each segment having a fixed number of consecutive samples,
- an autocorrelation calculation unit for calculating for each segment a conformity function for the signal, and
- peak detector for detecting peaks in the conformity function, the device further comprising a programmed unit:
  - for providing an intermediate signal derived from the speech signal,
  - for converting said intermediate signal to a binary signal, said binary signal being set to logical "1" where the intermediate signal exceeds a pre-selected threshold and to logical "0" where the intermediate signal does not exceed the pre-selected threshold,
  - for calculating the autocorrelation of the binary signal, and

- for using distance between peaks in the autocorrelation of the binary signal as an estimate of the pitch.

- 5           7. A device according to claim 6, which includes a  
filter which is adapted to provide the  
intermediate signal by filtering the speech  
signal through the filter based on a set of  
filter parameters estimated by means of linear  
10       predictive analysis (LFA).
- 15           8. A device according to claim 6, including a  
filter which is adapted to provide the  
intermediate signal by calculating an  
autocorrelation of a signal derived from the  
speech signal by filtering the speech signal  
through the filter based on a set of filter  
parameters estimated by means of linear  
20       predictive analysis (LPA).
- 25           9. A device according to claim 6, which is further  
adapted to select, if a peak corresponding to  
the distance between the peaks is represented by  
a number of samples, the sample having the  
maximum amplitude of said conformity function as  
the estimate of the pitch.

10. A device according to claim 6, wherein the device is a mobile telephone.

11. A device according to claim 6, wherein the device is an integrated circuit.

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Patent Application